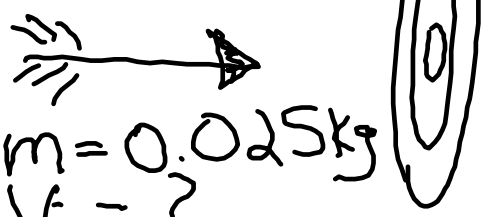
p 234 Q16



$$\Delta E_K = \Delta E_P$$

$$\frac{1}{2}mv^2 = mgh$$

$$\frac{1}{2}(0.755)(v_f^2) = (0.755)(9.8)$$

$$v_f = 1.53\ m/s$$

arrow target

$$m_1v_1 + m_2v_2 = (m_1 + m_2)v_f$$

stick

$$m_1v_i = m_Tv_f$$

$$v_i = \frac{m_Tv_f}{m_1}$$

$$v_i = \frac{(0.755)(153)}{(0.025)}$$

$$v_i = 46\ m/s$$

Q15

$P_{ti} = P_{tf}$ Bounce

$m_B V_{Bi} + m_S V_{Si} = m_B V_{Bf} + m_S V_{Sf}$

Perfectly elastic $E_{Kti} = E_{Ktf}$

$\frac{1}{2} m_B V_{Bi}^2 + \frac{1}{2} m_S V_{Si}^2 = \frac{1}{2} m_B V_{Bf}^2 + \frac{1}{2} m_S V_{Sf}^2$

Review

Ch 9 $p = mv$ $\Delta p = F_{net} \Delta t$

$P_{ti} = P_{tf}$

Ch 10 $W = F \cdot d$ $P = \frac{W}{t}$

$$MA = \frac{F_{out}}{F_{in}} \quad IMA = \frac{d_{in}}{d_{out}}$$

$$\text{efficiency} = \frac{W_{out}}{W_{in}} \times 100\%$$

chill

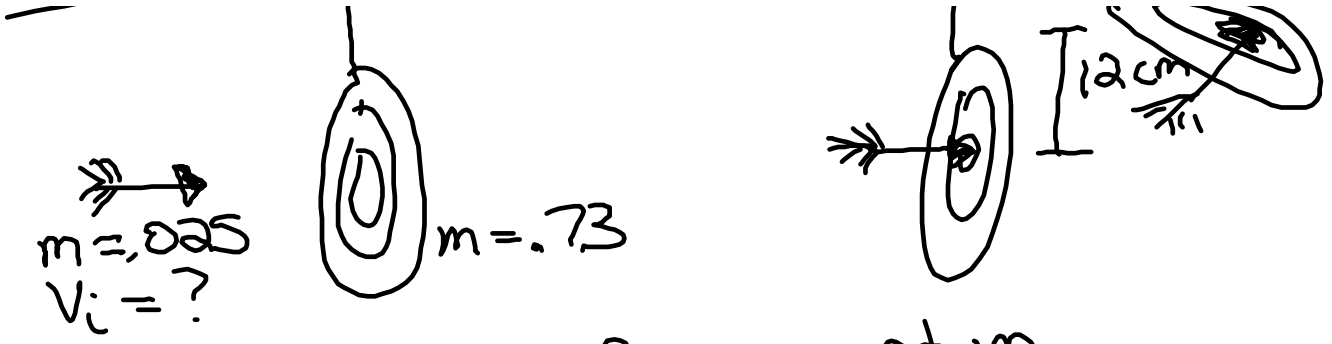
$$E_K = \frac{1}{2} m v^2$$

$$E_g = mgh$$

$$E_{Ti} = E_{Tf}$$

http://physics-pages.wikispaces.com/

p235 Q16

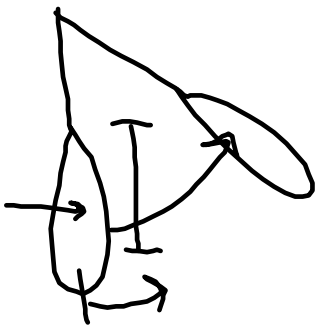


Conservation of momentum

$$m_1 v_1 + \cancel{m_2 v_2}^{0} = (m_1 + m_2) V_f$$

$$m_1 v_{1i} = m_T V_f$$

$$V_i = \frac{m_T V_f}{m_1}$$



$$\Delta E_k = \Delta E_p$$

$$\frac{1}{2} m v^2 = mgh$$

$$\frac{1}{2}(0.755) V_f^2 = (0.755)(9.8)(0.12)$$

$$V_f = 1.5 m/s$$

$$V_i = \frac{(.755)(1.5)}{(.025)}$$

$$V_i = 46.3 m/s$$

Ch 9 $p = mv$ $\Delta p = F_{net} \Delta t$

$$p_{ti} = p_{tf}$$

Ch 10 $W = F \cdot d$ $F \perp d$ $w = 0$

$$P = \frac{W}{t}$$

$$\text{efficiency} = \frac{W_{out}}{W_{in}} \times 100\%$$

$$MA = \frac{F_{out}}{F_{in}} \quad \text{or} \quad MA = \frac{d_{in}}{d_{out}}$$

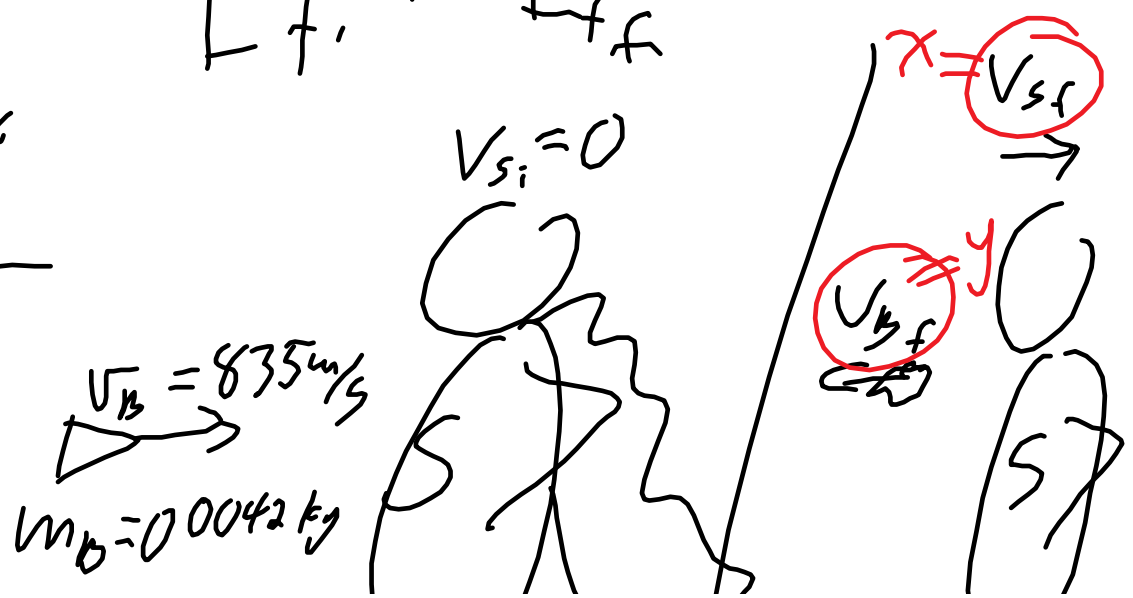
Ch 11 $W = \Delta \text{Energy}$

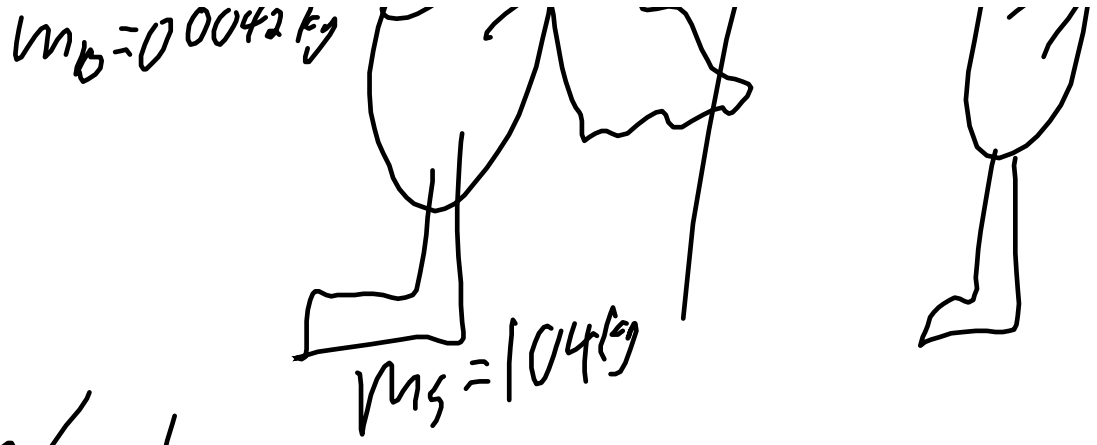
$$E_K = \frac{1}{2}mv^2 \qquad E_g = mgh$$

$$E_{ti} = E_{tf}$$

p234

Q15





Collision/explosion

$$P_i = P_f$$

$$m_B v_{Bi} + m_S v_{Si} = m_B v_{Bf} + m_S v_{Sf}$$

$$0.0042(835) = 0.0042x + \frac{104}{0.0042}y$$

Perfectly elastic $\sum E_{Ki} = \sum E_{Kf}$

$$\frac{1}{2}m_B v_{Bi}^2 + \frac{1}{2}m_S v_{Si}^2 = \frac{1}{2}m_B v_{Bf}^2 + \frac{1}{2}m_S v_{Sf}^2$$

$$835^2 = x^2 + \frac{104}{0.0042}y^2$$

$$835^2 = \left(835 - \frac{104}{0.0042}y\right)^2 + \frac{104}{0.0042}y^2$$

$$835^2 = 835^2 - 2\frac{835\,104}{0.0042}y + \left(\frac{104}{0.0042}\right)^2 + \frac{104}{0.0042}y^2$$

$$0 = -413523800.95 + \quad y^4.$$

$$v = 0.067 m/s$$